Health and Safety Plan

EE/CA - Phase I Field Investigations
Area 7 Pesticide Area of the
Additional and Uncharacterized Sites Operable Unit

Crab Orchard National Wildlife Refuge NPL Site
Marion, Illinois (Williamson County)

Revision 3 – Final
June 2014

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June 2014

Prepared By
TRC Environmental Corporation
Madison, Wisconsin

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Preface

This Health and Safety Plan (HASP) has been prepared to address field activities to be conducted for the Area 7 Pesticide Area of the Additional and Uncharacterized Sites Operable Unit at the Crab Orchard National Wildlife Refuge NPL site in Marion, Illinois. This document is for the Phase I field investigation of the Engineering Evaluation/Cost Analysis (EE/CA). While conducting the field activities, personnel may come in contact with fish tissue, soil, sediment, surface water, groundwater, and debris which potentially contain hazardous materials. All field activities will be conducted in accordance with the Work Plan, Field Sampling Plan, Quality Assurance Project Plan, and Health and Safety Plan. The HASP is considered the minimum health and safety requirements for personnel.

This HASP will be provided to all TRC staff, subcontractors, and oversight personnel during Phase I activities. Its contents will be considered the minimum health and safety requirements for personnel within the Exclusion Zones. Subcontractors will be required to develop and implement their own HASP applicable to their work in accordance with OSHA requirements and this HASP. Specific questions regarding the HASP should be addressed to the TRC Project Manager. A copy of the HASP will be available on-site for review by staff, subcontractors, and oversight personnel from the site TRC Health and Safety Representative (HSR).

This site-specific HASP has been developed to provide guidelines and procedures intended to protect the health and safety of personnel performing site work associated with the defined scope of work, which is summarized below and described in detail in the Field Sampling Plan.[1]

The procedures presented have been identified based on the analytical results from historical soil and groundwater sampling results and technical knowledge of the additional work to be performed at the site. The HASP has been developed from technical information available as of August 2012 and is subject to revision as new data and information about the site and site activities become available. In cases where new tasks are defined or new hazards are identified, field personnel will be required to acknowledge the changes to the HASP by re-signing the on-site sign-in sheet.

[1] TRC. 2014. Field Sampling Plan for an Engineering Evaluation/Cost Analysis (EE/CA), Pesticide Contamination at Area 7 of the Additional and Uncharacterized Sites Operable Unit, Crab Orchard National Wildlife Refuge NPL Site, Marion, Illinois (Williamson County). Revision 4, June 2014.

Section 1
Site Information

Description of Site

The Crab Orchard National Wildlife Refuge ("Crab Orchard" or the "Refuge"), located near Marion, Illinois, includes a site on the National Priorities List ("NPL") subject to the Comprehensive Environmental Response, Compensation, and Liability Act, as amended, 42 U.S.C. § 9601, et seq. ("CERCLA"). The NPL site is divided into seven operable units by which the investigation and cleanup of the site is organized.

The "Site" described herein covers the Warehouses, the surrounding area, and any area where hazardous substances have been released, or have otherwise come to be located (Figure 1-1).

The soil adjacent to the Warehouses, the interior of the buildings, and materials inside the Warehouses, as well as surface water, sediment, and groundwater are impacted by the release and/or substantial threat of release of pesticides and other hazardous substances.

Scope of Work

Great Lakes Synergy Corporation ("GLS") is completing field work for an Engineering Evaluation/Cost Analysis (EE/CA) for the Site. The overall objective of the EE/CA field work program is to collect sufficient data to characterize the nature and extent of contamination including contaminant fate and transport at the Site. The field work includes collection of data to complete the baseline risk assessment (human health and ecological risks) and to address data gaps in the characterization of the site. The data gaps include detailed characterization in the vicinity of the warehouses and the Lake Embayment and Crab Orchard Lake. Data is needed to determine whether pesticides are present in Crab Orchard Lake that may pose a current or potential threat to public health, welfare, or the environment or exceed ARARs.

The field investigation for the EE/CA will be completed in two phases. The field tasks for the Phase I investigation covered by this HASP are summarized below.

Scope of Work

FIELD TASK	SCOPE
Monitoring Well Installation	▪ Oversee installation and development of three groundwater monitoring wells ▪ Constructed using Hollow Stemmed Auger (HSA) to depth between 10-feet and 20-feet ▪ Constructed in field north of warehouses, minimal clearing anticipated
Fish Sampling	▪ Electrofishing and netting from boat in Crab Orchard Lake and embayment ▪ Collection of 64 fish samples ▪ Process and ship samples to laboratory
Groundwater Sampling	▪ Collect groundwater samples from eight on-site monitoring wells ▪ Process and ship samples to laboratory
Sediment Sampling	▪ Collect sediment samples from 26 locations ▪ Collect samples in Crab Orchard Lake and embayment ▪ Process and ship samples to laboratory
Surface Water Sampling	▪ Collect surface water samples from 26 locations ▪ Collect samples from a jon boat, or equivalent, in Crab Orchard Lake and embayment ▪ Process and ship samples to laboratory
Wipe Sampling Survey	▪ Collect eight wipe samples from building IN-1-3 ▪ Process and ship samples to laboratory
Building Survey	▪ Survey interior of buildings IN-1-3, IN-1-4, IN-1-5, and IN-1-6 ▪ Record and photograph contents of building ▪ Evaluate materials requiring sampling for asbestos and lead ▪ Contents in buildings will NOT be opened during survey ▪ NO sampling (asbestos, lead, or subslab work) will be completed during survey
Land Survey	▪ Survey location and elevation of monitoring wells and/or soil borings

Other Site Activities

The Refuge is administered by the United States Fish and Wildlife Service (FWS), and other activities are occurring near the Site. Concurrent activities to be aware of during field investigations are summarized below:

ACTIVITY/FEATURE	NOTES/SAFETY CONSIDERATIONS
Building Tenants	▪ No tenants present in IN-1-3, IN-1-4, IN-1-5, and IN-1-6 ▪ Two or more buildings have tenants — Building IN-1-2 used for storage — Building IN-4-1 used by Hospital Physician
Traffic	▪ Deliveries to Hospital Physician
Demolition	▪ Demolition of warehouses near Site may be occurring ▪ Confirm status of demolition with FWS prior to field activities
Hunting	▪ Hunting permitted in areas surrounding the Warehouses — Deer (week before and after Thanksgiving) — Turkey (Fall: Oct 20-28, Spring: late Mar – late Apr) ▪ Field work will NOT be completed in rifle hunting season ▪ Field work will NOT be completed within 100-yards of permitted hunting areas during other hunting seasons
Unexploded Ordinances (UXOs)	▪ UXOs are believed not present in Area 7 ▪ Be aware that UXOs do affect other Areas within Crab Orchard and require specific health and safety considerations ▪ Avoid entering other areas of Refuge outside of roads to access Area 7,
Security	▪ Gate located on Ogden Road at Area 8 may require code — Get code or key for FWS locks prior to field activities ▪ General Dynamics guards and FWS Law Enforcement may patrol site — Have FWS notify security of our field work — Obtain vehicle tag from FWS if needed. ▪ No alarms

Applicable Safety Standards or Regulations

☒ Federal OSHA ☐ State OSHA ☐ Owner/Client

Specific Standards:	29 CFR 1910 (OSHA)	29 CFR 1926 (Other Regulations)
☒ Medical Services and First Aid	1910.151	1926.50
☐ Hazard Communication (HAZCOM)	1910.1200	1926.59
☒ Lead Exposure	1910.1025	1926.62
☒ HAZWOPER	1910.120	1926.65
☒ Personal Protective Equipment (PPE)	1910.132-138	1926.95-107
☒ Respiratory Protection	1910.134	1926.103
☐ Ventilation	1910.94	1926.57
☒ Noise Exposure	1910.95	1926.52
☐ Illumination	N/A	1926.56
☐ Fire Protection	1910.157	1926.24 and 150-155
☐ Sanitation	1910.141	1926.51
☐ Materials Handling (rigging, etc.)	1910.176	1926.250-251
☐ Welding/Cutting	1910.251-255	1926.350-354
☐ Lockout/Tagout	1910.147	1926.417
☐ Electrical (flexible cords, etc.)	1910.305	1926.400-449
☐ Scaffolding	1910.28-29	1926.450-454
☐ Fall Protection (elevated work)	1910.23-29, 1910.66-68	1926.104-107; 500-503
☐ Ladders/Stairways	1910.25-27	1926.1050 and 1060
☐ Cranes, Derricks, Hoists, Elevators, etc.	1910.179-181	1926.550-555
☐ Aerial Lifts	1910.66-68	1926.556
☐ Earth Moving Equipment	N/A	1926.602
☐ Powered Industrial Trucks (forklifts)	1910.178	1926.602
☐ Excavations and Trenching	N/A	1926.650-652
☐ Concrete and Masonry	N/A	1926.700-706
☐ Steel Erection	N/A	1926.750-761
☐ Demolition	N/A	1926.850-860
☐ Asbestos	1910.1001	1926.1101
☐ Confined Space Entry	1910.146	1926.21
☐ Commercial Diving	1910.401-441	1926.1071-1092
☐ Compressed Gases	1910.101-105	N/A
☐ Ionizing Radiation	1910.1096	1926.53
☐ Benzene	1910.1028	1926.1128
☐ Cadmium	1910.1027	1926.1127
☒ Tools - Hand and Power	N/A	1926.300-307
☐ Blasting and Using Explosives	N/A	1926.900-914
☒ Boat Safety	N/A	46 USC 1451-89

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TRC - GIS

BASE MAP FROM USGS 7.5 MINUTE TOPOGRAPHIC QUADRANGLE SERIES.

N

1 " = 2,000 '
1:24,000

0 2,000 4,000
FEET

TRC
708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

EE/CA INVESTIGATION PHASE I
AREA 7 PESTICIDE AREA, AUS OU
CRAB ORCHARD NATIONAL WILDLIFE REFUGE

SITE LOCATION MAP

DRAWN BY:	PAPEZ J
APPROVED BY:	TRS
PROJECT NO:	194355
FILE NO.	194355-001a-slm.mxd
DATE:	JUNE 2013

FIGURE 1-1

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Section 2
Project Team

The roles and responsibilities related to health and safety for the Site are summarized below.

PROJECT TEAM MEMBER	ROLE	PROJECT RESPONSIBILITIES	PHONE
Tom Stolzenburg	Project Coordinator	▪ Advises project team on aspects of on-site health and safety ▪ Serves as point of contact with FWS for change in conditions at Site ▪ Reviews HASP	608/826-3661 (work) 608/358-5213 (cell)
Alyssa Sellwood	Project Manager	▪ Provides an overview of site facilities, equipment, and personnel ▪ Reviews field team aspects of on-site health and safety ▪ Addresses questions on the HASP ▪ Knows contingency plan for Site	608/826-3658 (work) 608/358-8001 (cell)
Jim Morse	Health and Safety Coordinator	▪ Reviews HASP ▪ Offers technical support to site HSR on health and safety issues. ▪ Maintains training records and reviews eligibility regarding medical surveillance plan	608/826-3692 (work) 608/334-9652 (cell)
Meredith Westover	Site Health and Safety Representative (HSR)	▪ Implements the HASP ▪ Advises field team on aspects of on-site health and safety ▪ Selects and reviews protective clothing and equipment with input ▪ Monitors the field team members for signs of heat/cold stress ▪ Monitors on-site hazards and conditions ▪ Monitors decontamination procedures ▪ Knows contingency plan for Site	608/826-3667 (work) 608/358-5035 (cell)

Section 3
Contingency Plan and Contacts

This contingency plan provides the emergency information needed should there be a sudden life or health-threatening situation where work activities are being conducted. The provisions of the contingency plan are to be implemented immediately in the event of an accident, severe injury, fire, or explosion which could threaten human health or the environment.

Emergency Route Map (see Figure 3-1)

Drive emergency route at least once before fieldwork begins, to verify the planned route.

Emergency Addresses

SITE		HOSPITAL	
Name:	Crab Orchard National Wildlife Refuge	Name:	Heartland Regional Medical Center
Address:	Mousertown Road and Ogden Road Marion, Illinois 62959	Address:	3333 West Deyoung Street Marion, IL 62959 618/998-7000

Emergency Procedures

The first responder should take the following course of action in the event of emergency:

EMERGENCY PROCEDURE	
Step 1	Evaluate scene for hazardous conditions and injuries.
Step 2	Call 911. Provide operator the location and nature of the emergency. Answer all the operator's questions and allow operator to hang up first.
Step 3	Administer first aid, if necessary, and as site safety conditions allow.
Step 4	Notify the Site HSR and other personnel at the site as soon as possible. If necessary, evacuate all visitors and non-essential personnel.
Step 5	Contact the TRC HSC and Technical Coordinator to inform them of the incident as soon as possible.
Step 6	Complete a written summary report or the incident for the Senior Safety Manager as soon as possible, but not later than 48 hours after the incident.

Emergency Contacts

The emergency contact and telephone numbers are summarized below.

EMERGENCY CONTACTS:	
Ambulance, Emergency Room, Police, Fire Dept.	911
Poison Control Center	1-800-222-1222
Hospital: Heartland Regional Medical Center	618/998-7000
TRC Project Coordinator:	Tom Stolzenburg 608/826-3661 (work) 608/358-5213 (cell)
TRC Project Manager (PM):	Alyssa Sellwood 608/826-3658 (work) 608/358-8001 (cell)
TRC National Safety Director (Mike Glenn):	Mike Glenn 949/727-7347 (work) 949/697-7418 (cell)
TRC Health & Safety Coordinator (HSC):	James Morse 608/826-3692 (work) 608/334-9652 (cell)
TRC Field Contact:	Meredith Westover 608/826-3667 (work) 608/358-5035 (cell)
Client:	Nancy Dehmlow (GLS) 847/437-0200
USFWS	Leanne Moore 618/998-5907 (work) 618/889-8399 (cell)

Emergency Equipment Required On Site

EMERGENCY EQUIPMENT:			
First Aid Kit	☒ TRC	☐ Subcontractor	
Fire Extinguisher	☒ TRC	☐ Subcontractor	☐ Client
Emergency Shower	☐ TRC	☐ Subcontractor	☐ Client
Eye Wash	☒ TRC	☐ Subcontractor	☐ Client

Site Resources

SITE RESOURCES:			
Drinking Water Supply	☒ TRC	☒ Subcontractor	☐ FWS
Wash Water Supply	☒ TRC	☒ Subcontractor	☒ FWS
Telephone – Cellular	☒ TRC	☒ Subcontractor	
Restroom	☒ TRC	☐ Subcontractor	☐ FWS

Near Miss Incident and Initial Report of Incident/Exposure

Field personnel are to report any incident, near miss, or injury, as soon as possible, by contacting the following:

☒ Senior Safety Manager

☒ HSC

☒ Project Coordinator/Project Manager

☒ Client

The incident report submittal operator will obtain the necessary information from the employee and enter the information into the H&S incident database. All appropriate H&S, HR, and legal staff will be notified and will follow up as necessary.

Pursuant to TRC's "Drug and Alcohol-Free Workplace" policy (#900013753), TRC may require employees or subcontractors to be tested upon reasonable suspicion, following accidents or incidents during work activities, or during travel to or from a project site.

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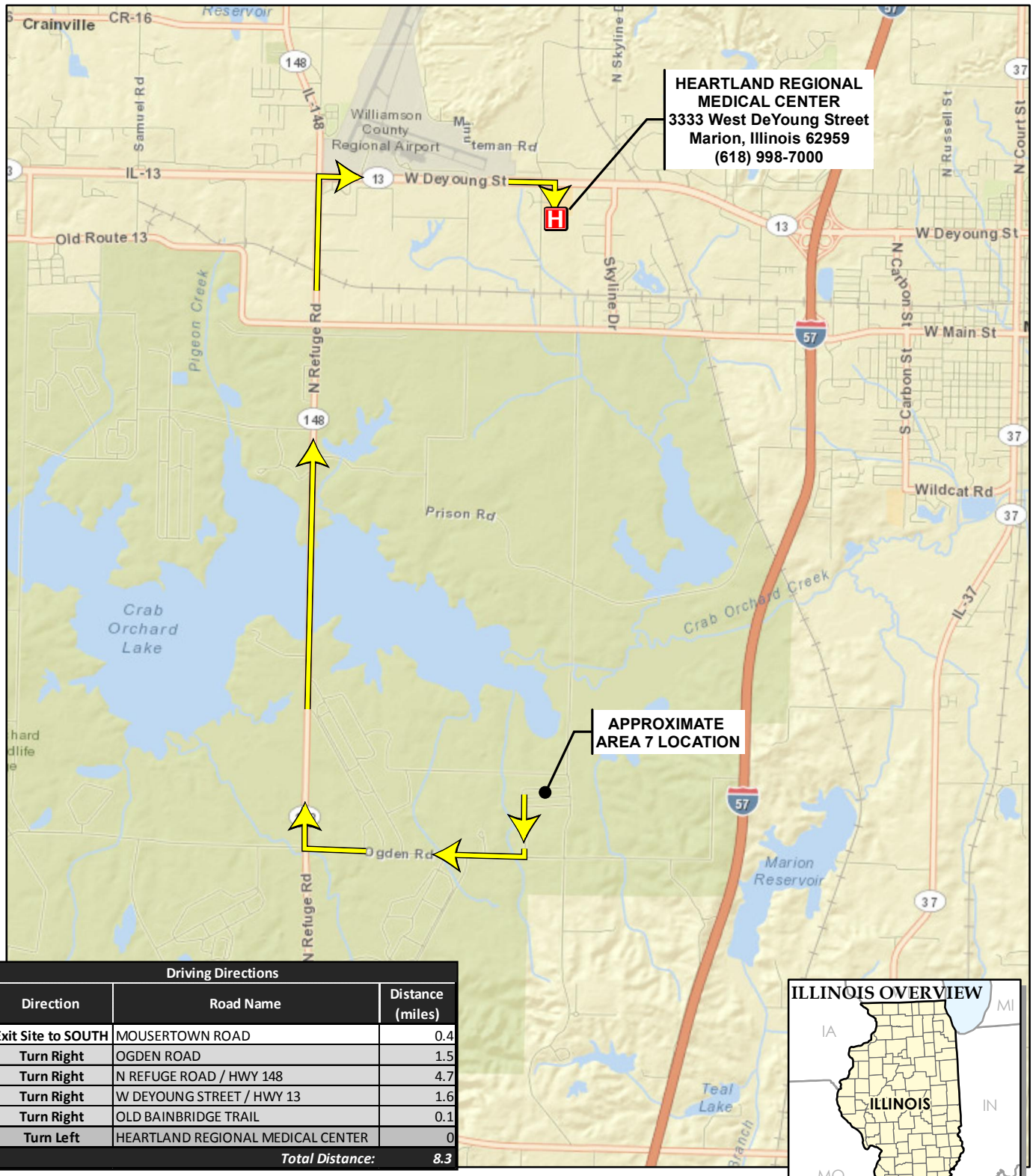
TRC - GIS



Driving Directions		
Direction	**Road Name**	**Distance (miles)**
Exit Site to SOUTH	MOUSERTOWN ROAD	0.4
Turn Right	OGDEN ROAD	1.5
Turn Right	N REFUGE ROAD / HWY 148	4.7
Turn Right	W DEYOUNG STREET / HWY 13	1.6
Turn Right	OLD BAINBRIDGE TRAIL	0.1
Turn Left	HEARTLAND REGIONAL MEDICAL CENTER	0
	Total Distance:	***8.3***

BASE MAP FROM ESRI "STREETS" WEB-BASEMAP SERVICE.

N

1 " = 1.00 MILES
1:63,360

0 1 2 Miles

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TRC

708 Heartland Trail
Suite 3000
Madison, WI 53717
Phone: 608.826.3600

EE/CA INVESTIGATION PHASE I
AREA 7 PESTICIDE AREA, AUS OU
CRAB ORCHARD NATIONAL WILDLIFE REFUGE

DRIVING ROUTE TO EMERGENCY MEDICAL FACILITY

DRAWN BY:	PAPEZ J
APPROVED BY:	TRS
PROJECT NO:	194355
FILE NO.	194355-007-H.mxd
DATE:	JUNE 2013

FIGURE 3-1

Section 4
Hazard Evaluation

This section describes the potential hazards associated with known tasks and sources of contamination based upon information that is available. The hazard evaluation has been prepared to meet the requirements of OSHA Standard 1910.120 and as such includes information regarding chemical hazards, physical hazards, and any other relevant site hazards.

Task Specific Hazard Table

TASK AND POTENTIAL HAZARD	SAFETY CONTROLS
WELL INSTALLATION/PUMPING ACTIVITIES	
Observe the drilling and installation of monitoring wells	
Drill rig/heavy equipment personnel interface, material handling	▪ Awareness training ▪ Maintain safe distance from machinery ▪ Wear hard hat, steel toed boots ▪ Wear gloves when handling material
Contact with contaminated water	▪ Wear proper PPE ▪ Adhere to site control zone and decontamination procedures
Underground and overhead utilities	▪ Subcontractors to contact diggers hotline and private utility locate. ▪ Confirm locate is complete and observe markings ▪ Awareness/observe overhead obstructions and maintain proper clearances
ENVIRONMENTAL SAMPLING	
Groundwater	
Contact with contaminated water	▪ Wear proper PPE ▪ Adhere to site control zone and decontamination procedures
Pump installation/removal	▪ Practice safe lifting approaches
Sample preservatives	▪ Wear proper PPE ▪ Be aware of sample preservative
Wipe Sampling/Survey of Building Conditions	
Poor building conditions	▪ Wear proper PPE ▪ Observe building conditions, and do not enter if unsafe ▪ Supply artificial light if needed

TASK AND POTENTIAL HAZARD	SAFETY CONTROLS
ENVIRONMENTAL SAMPLING (CONTINUED)	
Wipe Sampling/Survey of Building Conditions (continued)	
Inhalation and direct contact with contaminated dust	▪ Wear proper PPE ▪ Increase Level of Protection, if needed; wear particulate respirator in Building IN-1-3 ▪ Adhere to site control zone and decontamination procedures
Unknown contents/materials	▪ Do not open/disturb contents of building
Sediment/Surface Water Sampling	
Working on the water	▪ Work in teams of at least two persons to a boat ▪ Use buddy system when sampling from boat. On shore person should be able to maintain visual contact with boat during water work, and summon emergency assistance if needed ▪ Wear Type I and II PFD ▪ Do not sample during electrofishing ▪ See “Boat and Barge” under Physical Hazards ▪ Wear waders or hip boots when wading
Contact with contaminated media	▪ Wear proper PPE ▪ Adhere to site control zone and decontamination procedures
Sample preservative	▪ Wear proper PPE ▪ Be aware of sample preservative
Inclement weather	▪ Monitor weather prior to commencing activities on the water and while on water ▪ Move off water to safe location if inclement weather approaches while on water
Electrofishing	
Working on the water	▪ Work in teams of at least two persons to a boat ▪ Use buddy system when sampling from boat. On shore person should be able to maintain visual contact with boat during water work, and summon emergency assistance if needed ▪ Wear Type I and II PFD ▪ See “Boat and Barge” under Physical Hazards

TASK AND POTENTIAL HAZARD	SAFETY CONTROLS
ENVIRONMENTAL SAMPLING (CONTINUED)	
Electric shockers in water and currents	▪ Only personnel with proper training will operate electrofishing equipment ▪ Adhere to manufacturer's safety requirements for equipment ▪ Trained persons shall brief all on-site staff on the operations and safety requirements of electrofishing prior fish sampling. ▪ Maintain awareness of operations and electric current in the water during fishing ▪ Maintain a first aid kit and fire extinguisher on boat ▪ At least one member of boat crew to have certification in adult CPR and first aid training. ▪ Suspend electrofishing if bystanders, pets, or livestock are observed in or near water
Slippery Surfaces	▪ Wear slip resistant waders ▪ Be aware of wet surfaces
Inclement weather	▪ Monitor weather prior to commencing activities on the water and while on water ▪ Move off water to safe location if inclement weather approaches while on water

Chemical Table

The following table summarizes the chemical hazards that may be encountered during work at the Site based on the most recent data. Information regarding potential health effects associated with the site-related constituents is based upon maximum estimates of constituent concentrations and exposure parameters designed to err on the side of overestimating the potential occupationally-related risks associated with the pesticide contamination at Area 7 of the AUS OU

CHEMICAL HAZARD TABLE														
Complete [1] Substance Name (be specific)	Chemical Abstract Service Number (CAS)	Specific Applicable OSHA Standard (if any)	Physical State [2] (S, L, G, Aq, Vap, F, P)	Max. [3] Conc. Level Per Physical State	Potential Routes of Exposure [4] (Inh, Ing, Abs, Con, Ext)	Warning Properties	General [5] Control Measures (Eng., Admin., PPE)	IP [6] (eV)	VP[6] (mm HG)	LEL[6] (%)	UEL[6] (%)	IDLH [7]	ACGIH TLV (C, ST, TWA) [8] (R) or (T) [9]	OSHA PEL (C, ST, TWA) [8] (R) or (T) [9]
4,4'-DDD	72-54-8	None	S	12,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
4,4'-DDE	72-55-9	None	S	4,800 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
4,4'-DDT	50-29-3	None	S	100,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	$2x10^{-7}$	NA	NA	500 mg/m^3	1 mg/m^3	1 mg/m^3
Aldrin	309-00-02	None	S	1,300,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	$8x10^{-5}$	NA	NA	25 mg/m^3	0.05 mg/m^3	0.25 mg/m^3
Endosulfan I (Alpha)	959-98-8	None	S	12 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	0.1 mg/m^3	NA
Alpha-Chlordane	5103-71-9	None	S	490 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	100 mg/m^3	0.5 mg/m^3	0.5 mg/m^3
Beta BHC	319-85-7	None	S	8.4 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Endosulfan II (Beta)	33213-65-9	None	S	18 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	0.1 mg/m^3	NA

CHEMICAL HAZARD TABLE														
Complete [1] Substance Name (be specific)	Chemical Abstract Service Number (CAS)	Specific Applicable OSHA Standard (if any)	Physical State [2] (S, L, G, Aq, Vap, F, P)	Max. [3] Conc. Level Per Physical State	Potential Routes of Exposure [4] (Inh, Ing, Abs, Con, Ext)	Warning Properties	General [5] Control Measures (Eng., Admin., PPE)	IP [6] (eV)	VP[6] (mm HG)	LEL[6] (%)	UEL[6] (%)	IDLH [7]	ACGIH TLV (C, ST, TWA) [8] (R) or (T) [9]	OSHA PEL (C, ST, TWA) [8] (R) or (T) [9]
Dieldrin	60-57-1	None	S, L	290,000 ug/kg, 130 ug/L	Inh, Ing, Abs, Con	Poor	PPE	NA	8×10^{-7}	NA	NA	50 mg/m^3	0.1 mg/m^3	0.25 mg/m^3
Endosulfan Sulfate	1031-07-8	None	S	44 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Endrin	72-20-8	None	S	12,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	Low	NA	NA	2 mg/m^3	0.1 mg/m^3	0.1 mg/m^3
Endrin Aldehyde	7421-93-4	None	S	9,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Endrin Ketone	53494-70-5	None	S	20,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Gamma BHC (Lindane)	58-89-9	None	S	5.6 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	$1x10^{-5}$	NA	NA	50 mg/m^3	0.5 mg/m^3	0.5 mg/m^3
Gamma-Chlordane	5103-74-2	None	S	1,600 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Heptachlor	76-44-8	None	S	69 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	$3x10^{-4}$	NA	NA	35 mg/m^3	0.5 mg/m^3	0.5 mg/m^3
Heptachlor Epoxide	1024-57-3	None	S	11 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Hexachloro-benzene	118-74-1	None	S	2,700 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Isodrin	465-73-6	None	S	60,000 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Methoxychlor	72-43-5	None	S	47 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	Very low	NA	NA	5000 mg/m^3	10 mg/m^3	15 mg/m^3

CHEMICAL HAZARD TABLE														
Complete [1] Substance Name (be specific)	Chemical Abstract Service Number (CAS)	Specific Applicable OSHA Standard (if any)	Physical State [2] (S, L, G, Aq, Vap, F, P)	Max. [3] Conc. Level Per Physical State	Potential Routes of Exposure [4] (Inh, Ing, Abs, Con, Ext)	Warning Properties	General [5] Control Measures (Eng., Admin., PPE)	IP [6] (eV)	VP[6] (mm HG)	LEL[6] (%)	UEL[6] (%)	IDLH [7]	ACGIH TLV (C, ST, TWA) [8] (R) or (T) [9]	OSHA PEL (C, ST, TWA) [8] (R) or (T) [9]
Lead	7439-92-1	1910.1025	S	541 mg/kg	Inh, Ing, Abs	None	PPE	NA	0	NA	NA	100 mg/m^3	0.05 mg/m^3	0.050 mg/m^3
PCBs	11097-69-1	None	S	2,100 ug/kg	Inh, Ing, Abs, Con	Poor	PPE		$6x10^{-5}$	NA	NA	5 mg/m^3	NA	0.5 mg/m^3
Mercury	7439-97-6	None	S	53 ug/kg	Inh, Ing, Abs, Con	None	PPE	NA	0.0012	NA	NA	10 mg/m^3	0.025 mg/m^3	0.1 mg/m^3
1,2,4-Trimethyl-benzene	95-63-6	None	S	12,000 ug/kg	Inh, Ing, Abs	Poor	PPE	8.27	1	0.9	6.4	NA	25 ppm	NA
1,2-Dichloro-propane	78-87-5	None	S, L	660 ug/kg, 120 ug/L	Inh, Ing, Abs, Con	Poor	PPE	10.87	40	3.4	14.5	400 ppm	347 mg/m^3	350 mg/m^3
Ethylbenzene	100-41-4	None	S	140,000 ug/kg	Inh, Ing, Abs	Poor	PPE	8.76	7	0.8	6.7	800 ppm	100 ppm	100 ppm
Total Xylenes	95-47-6	None	S	480,000 ug/kg	Inh, Ing, Abs	Poor	PPE	8.44-8.56	7-9	0.9-1.1	6.7-7.0	900 ppm	100 ppm	100 ppm
Benzo(a)pyrene	50-32-8	None	S	1,800 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Benzo(a)-anthracene	56-55-3	None	S	1,600 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Benzo(b)-fluoranthene	205-99-2	None	S	3,300 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Benzo(g,h,i)-perylene	191-24-2	None	S	1,300 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA
Benzo(k)-fluoranthene	207-08-9	None	S	2,100 ug/kg	Inh, Ing, Abs, Con	Poor	PPE	NA	NA	NA	NA	NA	NA	NA

CHEMICAL HAZARD TABLE														
Complete [1] Substance Name (be specific)	Chemical Abstract Service Number (CAS)	Specific Applicable OSHA Standard (if any)	Physical State [2] (S, L, G, Aq, Vap, F, P)	Max. [3] Conc. Level Per Physical State	Potential Routes of Exposure [4] (Inh, Ing, Abs, Con, Ext)	Warning Properties	General [5] Control Measures (Eng., Admin., PPE)	IP [6] (eV)	VP[6] (mm HG)	LEL[6] (%)	UEL[6] (%)	IDLH [7]	ACGIH TLV (C, ST, TWA) [8] (R) or (T) [9]	OSHA PEL (C, ST, TWA) [8] (R) or (T) [9]
Trichloro-ethylene (TCE)	127-18-4	None	L	1,100 ug/L	Inh, Abs, Ing, Con	Good	PPE	9.32	14	8	10.5	150 ppm	50 ppm (TWA)	100 ppm (TWA)
HCl	7647-01-0	None	L	3N	Con, Ing	Good	PPE	12.74	40.5 atm	None	None	50 ppm	2 ppm	5 ppm

Notes:
(1) Use OSHA regulated name, not elemental forms. If available, attach MSDS. Identify any sample preservative or O&M chemicals or subcontractor chemicals in this table also.
(2) S = Solids, L = Liquid, G = Gas, Aq = Aqueous, Vap = Vapor, F = Fume, P = Airborne Particulate
(3) If available, attach laboratory results or summary tables.
(4) Inh = Inhalation Hazard, Ing = Ingestion Hazard, Abs = Absorption Hazard, Con = Contact Hazard, Ext = External Exposure Hazard
(5) See the following sections for detailed control measures: personal protection equipment (PPE), Air Monitoring (Admin), or Site Control (Admin and Eng.).
(6) IP = Ionization Potential, VP = Vapor Pressure, LEL = Lower Explosive Limit, UEL = Upper Explosive Limit, N/A = Not Applicable, N.D. = Not Determined
(7) IDLH = Immediately Dangerous to Life and Health. NEVER enter IDLH conditions on site without proper respiratory protection.
(8) C = Ceiling Value, ST = Short-Term Exposure Limit, TWA = Time-Weighted Average, None Est. = None Established
(9) R = Respirable Limit, T = Total Limit

Physical Hazard Table

The following table summarizes physical hazards that may be present at the Site, and the control measure that should be taken if the physical hazard is encountered.

PHYSICAL HAZARD	CONTROL MEASURE
Aboveground Storage Tanks (AST)	Be aware of any above ground storage tanks and the type of material being stored in them. Be aware of the potential of spills, fires, explosions, etc., while working near the tanks. Stay clear of tanks whenever possible, and be aware of any equipment operators near the tank(s).
Animals (dogs, etc.)	Be aware of any animals on site or adjacent to the site. Appropriate care should be taken if any feral (wild) animals are encountered.
Boat or Barge	A boat or barge should be used that is adequately stable for the type of activity conducted. The boat or barge should have all of the appropriate and current licensing and registrations required by the applicable regulatory agencies. All applicable laws and regulations will be followed when launching the boat or barge, and when navigating to and from the work site. Personal floatation devices should always be worn while navigating the boat or barge. Avoid sampling from a boat when unsafe water turbulence (waves) exists, and avoid standing in a boat. Always use buddy system when sampling from boat. The following equipment is <u>required</u> for all boats: ▪ A Type I or II personal flotation device (PFD) approved by United States Coast Guard (USCG) for every person on board the boat The following additional equipment is <u>required</u> for all electrofishing boats ▪ Fire extinguisher ▪ First aid kit The following equipment is <u>recommended (if not already required):</u> ▪ A Type IV throwable PFD ▪ Audible distress signal device (air horn, whistle) ▪ Fire extinguisher (if engine-propelled) ▪ Auxiliary propulsion (spare paddles, trolling motor) ▪ Bow and stern lines ▪ Anchor and anchor line ▪ First aid kit ▪ Visual distress signal device(s) (flares, dyes) ▪ Additional PFDs
Briars or Thistles	Be aware of any briars or thistles on site. Wear appropriate clothing and gloves. Avoid contact with briars or thistles whenever possible.
Business Traffic	Be aware of traffic patterns associated with local businesses near the work site. Allow traffic to enter and exit the businesses in such a manner to avoid creating traffic hazards, back-ups, delays, or potential accident situations.
Cement Dust	Stay clear of mixing operations and avoid contact with, or breathing of the dust.

PHYSICAL HAZARD	CONTROL MEASURE
Chain Saws	Stay clear of any chain saw operations. Subcontractor is responsible for the safe use of chain saws on site.
Cleaning Agents	Use caution when applying cleaning agent to equipment. Use gloves, safety glasses, splash shields, and protective clothing as needed.
Cold Stress	Work schedules may be modified when temperatures are below 20°F as measured by the wind chill factor. Take frequent breaks to warm up. Drink plenty of fluids. Wear appropriate clothing, and monitor for cold stress symptoms (frostbite, hypothermia, etc.).
Compressed Air or Gas Cylinders	Compressed air or gas cylinders should be clearly marked, and they should be stored, transported, and secured in an approved manner.
Compressed Air/Gas or Pressurized Liquids Hoses, Lines & Fittings	Compressed air or gas, or pressurized liquid lines or hoses should be inspected at least daily, or in the event a leak develops, or if a line or hose is run over or crimped.
Confined Spaces (tanks, vaults, vessels, trenches, manholes, some excavations, etc.)	The scope of this project does not entail entry into confined spaces. Confined spaces will not be entered unless a confined space entry permit has been completed, signed, and approved, and all participating personnel are trained in confined space entry procedures, including safety, and rescue procedures. Real and potential hazards of confined space are not addressed by this hazard assessment, and health and safety plan.
Cutting Tools	Stay clear of contractors' cutting tools, especially saws and torches. Be aware that cutting operations could create other hazards, such as falling objects, or shifting materials, etc. Safety glasses should be worn while using cutting tools. Spark-proof tools should be used when working in areas of potential explosive or flammable conditions.
Demolition Activities	Stay clear of walls, ceilings, roofs, etc., as they are being demolished.
Drums	If drums are used on-site, they should be clearly labeled with the name of the contents. Drums should only be handled with the appropriate equipment. Drums discovered during excavations, etc., shall not be opened or moved until appropriate identification can be performed. At a minimum, Level B protection is required for sampling any unlabeled drums discovered during remediation procedures.
Elevated Work	For any construction work activities elevated 6 feet or more, or other non-construction activities elevated 4 feet or more, fall protection must be provided. Caution should be taken on catwalks and ladders because of potential slippery conditions, or the potential for footwear to catch on the surfaces.
Energized Sources (electrical equipment or hookups, lines, etc.,) (Lockout/Tagout)	Contractors for all electrical activities and any facility equipment with moving parts should follow proper lock-out/tag-out procedures, and only properly trained employees will perform the work. Employees will not perform any lock-out/tag-out activities unless personnel are properly trained in lockout/tagout procedures. Heed any caution signs or labels.
Equipment Exhaust	Equipment exhaust should be ventilated away from the work area while drilling inside structures. Industrial fans can be used to move exhaust out of the area.

PHYSICAL HAZARD	CONTROL MEASURE
Ergonomic Issues (job hazard analysis)	Ergonomic hazards will be addressed on a site-specific basis once mobilization to the field has occurred. Workstations will be evaluated on an individual basis.
Evening Work	If work is performed during the evening hours, work shall be limited by the availability and the quality of artificial lighting. Care should also be taken to avoid slip, trip, and fall hazards that are not as easy to identify during low light conditions.
Excavations	Stay clear of excavation walls. Field personnel will not enter an excavation, in accordance with 1926 Subpart P. Subcontractor must provide a competent person on site, if one is required by the planned activities. Side cuts should conform to 1926 Subpart P requirements, or shoring should be used. All open excavations should be secured using traffic cones, barrier tape, or barricade signs stating "Do Not Enter Excavations," especially if left open overnight.
Facility Equipment/Machinery	Be aware of active and moving client equipment on site.
Facility Piping - above ground	Stay clear of above ground pipes. Pipes can be overhead hazards, or trip hazards. Pipes can be hazardous because of the material flowing through them, such as steam, natural gas, toxic chemicals, etc. Some pipes are also coated with hazardous material such as asbestos.
Facility Piping - below ground	Coordinate with FWS to identify all applicable underground facility pipe locations prior to any subsurface activities. TRC will ensure that utility clearance is completed before any intrusive work begins. Utility clearance will be conducted via Illinois' one-call system (JULIE), and by local utilities not participating in the one-call service, or by a locator contractor.
Fall Hazard	Proper tie-off, harnesses, railings, etc. should be used when performing work on ladders, scaffolding, man-lifts, or on the roof of buildings, etc. Stay clear of the edges of pits, trenches, quarries, etc.
Falling Objects	Be aware of any potential falling objects or materials on site. Stay clear of any areas identified as potential falling object areas.
Fences	Be aware of fences in disrepair that may be trip hazards, or may have materials that could cause punctures or cuts. Use caution when crossing over or under fences.
Field Equipment	If field equipment is heavy or awkward to carry, get assistance or use carts to help move around the site.
Field Vehicle	Field personnel shall follow all applicable state and federal traffic laws while traveling to and from the site, and while working on the site. In particular the following laws should be followed: speed limits, parking restrictions, use of wipers and lights during precipitation events, limiting cell phone use, etc. It is the responsibility of the driver to verify that all safety equipment on the vehicle is working properly before they drive the vehicle. In particular the following items should be checked: tire pressure, tire tread, windshield wipers, windshield washer, headlights, tail lights, brake lights, spare tire, fire extinguisher, first aid kit, etc.
Fire Hazards	Eliminate sources of ignition in work areas that have ignitable materials. Provide an ABC fire extinguisher in close proximity to the support zone.

PHYSICAL HAZARD	CONTROL MEASURE
Flooded Areas	Do not drive through flooded areas or standing water. Do not wade into moving water or water deeper than 2 feet without adequate assistance.
Flying Debris/ Eye Injuries	Be aware of any flying debris on site and wear protective eyewear when necessary.
Hand Tools	Use only the appropriate tool for the task at hand. Use the tool(s) as designed, described, and intended by the manufacturer.
Heat Stress	The work schedule may be modified if the ambient temperature is more than 80°F. Take breaks as necessary, and drink plenty of fluids. If necessary, wear sunscreen and sunglasses on bright days. Monitor site personnel for signs of heat stress symptoms (heat rash, heat cramps, heat exhaustion, or heat stroke).
Heavy Equipment.	Contractor is responsible for safe operation of equipment. All mobile heavy equipment must have a functioning backup alarm, and operators must comply with equipment manufacturer's instructions. Maintain proper distance and remain in line of sight of operator and out of reach of equipment. Isolate equipment swings, if possible. Make eye contact with the equipment operator before approaching the equipment. Understand and review hand signals, and wear safety vest, if necessary.
Heavy Lifting	Use proper lifting procedures and equipment when handling heavy objects such as drums, manhole covers, tank covers, etc.
High Pressure Gas Lines, etc.	Be aware of high pressure gas lines, and follow approved safety precautions when working with or around the lines.
Housekeeping	All field vehicles, job trailers, and field offices will be properly cleaned and organized to prevent cluttered work and storage areas.
Hunters/Firing Range, etc.	Be aware of surrounding activities that may involve hunting, firearms, etc. that may not be in your immediate area, but could be create an unsafe work environment. Do not work in hunting area during rifle hunting season, and maintain at least 100 feet from hunting areas during other seasons.
Insects (ticks, bees, spiders, etc.)	Site workers with known allergies to insect bites should carry their own medication. In case of emergencies, inform fellow workers of any severe allergies. Use insect repellant as necessary, and as specifically allowed on site. If possible, wear long-sleeved shirts and pants. If appropriate, check for ticks at the end of each day. Have other appropriate first aid supplies handy for bites.
Long Hours/Fatigue	Long work hours can lead to fatigue, and fatigue can lead to the physical inability to perform the work in a safe manner, or travel to, or from, a work site in a safe manner. If long work hours are scheduled, or if the scheduled work takes longer than planned, field staff should determine if fatigue is, or will be, an issue. Field staff should evaluate whether they are able to complete the work in a safe manner, or whether they are able to travel in a safe manner. If fatigue is an issue, appropriate breaks should be planned or taken, including overnight stays when necessary.

PHYSICAL HAZARD	CONTROL MEASURE
Material Handling	Move containers and heavy material only with the proper equipment, and secure them to prevent dropping, falling, or loss of control during transport. Stay clear of material handling operations, especially near slopes. Do not stand down the slope from equipment, supplies or materials being moved above on the slope, or being deployed onto the slope.
Material Storage	Stored material may be a falling hazard, or a crush hazard. Do not stand adjacent to materials stacked up, such as pipes, geosynthetic rolls, etc., or in the area of deployment.
Natural Gas	Natural gas is flammable and explosive. Keep ignition sources away from gas sources. Use spark proof tools when working with gas lines, etc.
Noise	Hearing protection must be worn when noise levels exceed 85 dBA in the work area. If you need to raise your voice to be heard at the work site, then hearing protection should be worn. Hearing protection will be worn near drill rigs.
Overhead Hazards	Pay attention to overhead equipment, piping, and structures. A hard hat must be worn at all times when overhead hazards are present on site.
Pedestrian Traffic (public, client, workers)	Be aware of pedestrian traffic patterns and, route traffic around the exclusion zone(s), as necessary, to avoid distractions and the potential for exposures or accidents. Use appropriate barricades and caution tape to mark exclusions zones.
Poisonous Plants	Be able to identify any local poisonous plants and avoid them if possible, or wear protective clothing as necessary. When removing potentially exposed clothing or PPE, the clothing or PPE should be carefully and thoroughly washed or decontaminated.
Power Washing Equipment	Stay clear of the power washing nozzles and equipment.
Propane Tanks	Be aware of propane tank locations, and any gas lines leading to or from the tanks.
Sample Preservative Chemicals	Wear safety glasses and nitrile gloves when adding preservative chemicals to sample bottles or vials. Have clean wash water nearby.
Severe Weather	Work may be suspended if dangerous weather conditions (lightening, tornadoes, high winds, heavy rain, freezing rain, etc.) occur. Be aware of changing weather conditions, and be prepared to take shelter as necessary. Potential shelters should be identified prior to beginning work.
Sharp Objects	Wear appropriate gloves when handling sharp objects, and use appropriate equipment to move objects.
Slippery Ground/Surfaces	Exercise caution, especially on slopes, field trailer floors and stairs, after a precipitation event. Use slip resistant boots, or implement surface preparations to eliminate the slippery nature of the surface prior to accessing the area. Spill control measures and general housekeeping should be utilized to help prevent slipping on wet floors, wet pavement, and general work areas.
Slips, Trips, and Falls	Maintain clear walkways for work areas.
Snakes	Be aware of the potential for snakes in the area and wear snake boots, snake chaps, gaiters, or leggings as needed.

PHYSICAL HAZARD	CONTROL MEASURE
Steam Cleaning Equipment	Stay clear of the steam cleaning nozzles and equipment.
Steep Slopes or Banks	Pay attention to footing and walking. Stay a safe distance from unstable or extremely steep slopes. Wear appropriate footwear. Be aware of potential slope or bank failures. Heavy equipment should not be operated on or near unstable slopes or banks.
Strong Nuisance Odors	Strong odors should be ventilated before entering a work area.
Sunburn	For extended periods of time outdoors on sunny days, sunglasses, long-sleeved shirts and long pants should be worn to help prevent sunburn and eye problems. Wear sunscreen as appropriate for the project.
Surface Water	Use the buddy system when working on or next to bodies of surface water greater than 1-foot in depth. Wear USCG-approved personal floatation devices when on or adjacent to bodies of water.
Terrain	Uneven or steep terrain can cause hazardous conditions for walking and transporting equipment around the site. Use caution when working on uneven surfaces, and avoid working down-slope from heavy equipment, or materials being moved or stored.
Traffic (client, contractors, public, semi-trucks, forklifts, etc.)	Obey all posted speed limits. Park in designated areas only. Be aware of traffic patterns on site, and during access to the site. Use orange traffic cones and barrier warning tape, as needed, or if within 25 feet of the right-of-way. Wear safety vests when working in or near traffic areas.
Transporting Hazardous Materials	Do not transport hazardous materials.
Tree Cutting	Stay clear of tree cutting activities.
Trenching	Do not enter trenches except in accordance with 1926 Subpart P. Be aware that some trenching conditions may result in a confined space condition.
Trip Hazards (wires, cords, hoses, debris, corn stubble, uneven surfaces, etc.)	Temporary wires, cords, hoses, etc., should be properly located, marked, and protected to help prevent tripping and disruption to work activities. Trip hazards are particularly a problem early in the morning, late in the day, or under other poor lighting conditions.
Underground Storage Tanks (USTs) (Septic Tanks)	If any unknown UST's are encountered, drilling or excavations will be terminated in that location until a new scope of work, Risk Assessment and Health & Safety Plan can be developed.
Uneven Surfaces	Be aware of uneven walking or driving surfaces and exercise caution when moving around the site.
Utilities – Overhead (electrical, telephone, cable TV, etc.)	A subcontractor will locate and identify all overhead utilities. A minimum clearance of 20 feet must be maintained between equipment and overhead utility lines.
Utilities – Underground (electric, gas, telephone, water, storm sewer, sanitary sewer, cable TV, etc.).	Coordinate with FWS to mark on-site underground utilities, product lines, pipes, and tanks. TRC will ensure that utility clearance is completed before any intrusive work begins. Utility clearance will be conducted via Illinois' one-call system (JULIE), and by local utilities not participating in the one-call service, or by a locator contractor.

Section 5
Personal Protective Equipment

Levels of Protection

Personal protective equipment (PPE) must be worn whenever the potential exists for employees to be exposed to affected media or specific physical hazards requiring PPE. These work activities will require modified Level D protection, at a minimum, based on the most current information available for the Site. If modified Level D protection is evaluated to be inadequate for a given task, all work will stop on that task, and PPE requirements will be reevaluated and change in Level of Protection may be implemented.

The type of PPE required will be defined by the work zone and work task. Any personnel working within a PRG exclusion zone (see Section 7) will be required to wear tyvek and disposable booties in that area. In addition, each work task (inside or outside of a PRG exclusion zone) will require PPE as summarized in the table below.

TASK	MINIMUM LEVEL OF PPE[1]	PPE DESCRIPTION
Drilling and installation of monitoring wells	D	▪ Safety glasses ▪ Hearing protection ▪ Chemical resistant gloves ▪ Hard hat ▪ Steel toed boots ▪ Tyvek suits and booties
Groundwater Sampling	D	▪ Safety glasses ▪ Chemical resistant gloves ▪ Steel toed boots ▪ Tyvek suits and booties
Wipe Sample Collection and Building Surveys	D[2]	▪ Hard hat ▪ Safety glasses ▪ Chemical resistant gloves ▪ Steel toed boots ▪ Tyvek suits and booties
Surface Water/Sediment Sampling/	D	▪ Type I or II PFDs, ▪ Safety glasses ▪ Chemical resistant gloves ▪ Chest or hip waders (with no leaks) for launching, if necessary

TASK	MINIMUM LEVEL OF PPE(1)	PPE DESCRIPTION
Fish Sampling	D	▪ Type I or II PFDs, ▪ Chest or hip waders (with no leaks) for launching ▪ Hearing protection ▪ Rubber electrician gloves ▪ Chemical resistant gloves (for sample processing, if applicable)

Notes:
(1) Persons should also wear pants and long sleeves when completing tasks.
(2) See Change in Level of Protection.

Changes in Levels of Protection

Changes to the level of protection shall be made only after the required approvals are obtained. Upgrades in protection can be made at the Site HSR discretion, while downgrades in protection can only be made after consulting with the HSC or Senior Safety Manager. If changes in level of protection are warranted, the Site HSR will inform field personnel and the TRC PM of the required changes and will record the change in the field log book.

Changes in level of protection may be needed for any of the Tasks, but Tasks with specific triggers for upgrade in PPE are summarized below.

TASK	TRIGGER FOR CHANGE	NEW LEVEL OF PPE(1)	ADDITIONAL PPE
Wipe Sample Collection/Building Survey	Dust concentration over 100 ug/m^3(1)	C	▪ ½ face respirator with particulate filter

Note:
(1) See Air Monitoring.

Section 6
Air Monitoring

The following table summarizes monitoring instruments that were considered and could be used to measure airborne contaminant concentrations in the breathing zone, if needed to complete the scope of work. Air monitoring for Phase I tasks is only required for work in the warehouses to monitor dust concentrations.

MONITORING EQUIPMENT	LOCATION OF MONITORING	FREQUENCY OF MONITORING	ACTION LEVELS
☐ Combustible Gas Indicator	☒ N/A ☐ Monitoring Plan Attached ☐ Confined Space ☐ Specify	☐ Continuously when potential combustible gases or lack of oxygen are suspected. ☐ Specify	5-10% LEL: continue with caution > 10 % LEL: evacuate the area ☐ Specify
☐ O2 Monitor ☐ CO Monitor ☐ H_2S Monitor	☒ N/A ☐ Confined Space ☐ Specify	☐ Continuously when excess oxygen (>22.5%) or lack of oxygen (<19.5%) are suspected. ☐ Specify	< 19.5% Oxygen: evacuate the area; supplied air may be needed > 22.5% Oxygen: evacuate the area; potential fire hazard ☐ Specify
☐ Colorimetric Tubes Type: Type: Type:	☒ N/A ☐ Specify ☐ Sample Container ☐ Confined Space ☐ Specify	☐ Periodically during sampling for analytical purposes only ☐ Whenever noticeable odor is present ☐ Specify	☐ Specify
☐ PID Lamp Needed: ☐ 9.8 eV ☐ 10.6 eV ☐ 11.7 eV Calibration Gas: Isobutylene Correction Factor:	☒ N/A ☐ Sample Container ☐ Confined Space ☐ At well head prior to sampling	☐ Specify	☐ Specify
☐ FID	☒ N/A ☐ Specify	☐ Specify	☐ Specify
☒ Mini-RAM	☐ N/A ☒ on at least one person working in warehouse	☒ continuous during work in warehouses	☒ 100 ug/m^3
☐ Laboratory Supported ☐ Personal ☐ Area ☐ Perimeter	☒ N/A ☐ Specify	☐ Specify	☐ Specify

Section 7
Site Control Measure and Decontamination

Site Controls

The following Site Controls have been established with regards to site access and work limitation. The site control measures are to be reviewed at the start of each day at the tailgate meeting with all on-site parties.

Site Entry Procedures

SITE ENTRY PROCEDURE FOR EXCLUSION ZONE AND CONTAMINATION REDUCTION ZONE	
Step 1	Notify Site H&S Representative.
Step 2	Read H&S Plan and sign Acknowledgment Statement(1).
Step 3	Wear proper PPE while on-site.

Note:

(1) TRC will provide the HASP for review for all on-site workers. TRC will provide TRC employees with appropriate protective equipment to fulfill the requirements of this HASP. All others, including visitors, are responsible for providing their own protective equipment and must accept responsibility for their personal health and safety while on the site.

Work Limitations

The following work limitations will apply to all field personnel working in the Exclusion Zone and Contamination Reduction Zone:

ACTIVITY	DETAILS
Eating	No eating, drinking, or chewing gum, smoking, or tobacco will be allowed.
Water Work or Increased Level of PPE	Any work occurring on the water in a boat or in waders, or in the event a level of protection greater than Level D becomes required for a specific task, the "buddy system" will be employed such that at least one other employee can observe another. The purpose of this system is to be able to provide rapid assistance in case of an emergency.
Travel	Seat belts are required to be used in all moving vehicles.*
Temperature	When temperatures are either above 80°F or below 20°F, work schedules may be modified.
Weather	Work will be suspended if weather conditions dictate (e.g., Lightning and other storm conditions threaten worker safety.

*Applies to the Support Zone.

Site Work Zones

The Site Work Zones have been established to minimize the transfer of contaminants from and within the project site.

Exclusion Zone(s)

The exclusion zones are the areas where contamination does or could occur. When defining an "exclusion zone" for the purposes of site control, the goal is to minimize the potential contamination of workers and protect the public from the sites' hazards, and prevent the uncontrolled transportation of contaminants from the site. Therefore, exclusion zones are developed based on the potential for release of contaminants to the environment, or exposure to workers. There are two types of exclusion zones defined for the Area 7 pesticide area of the AUS OU. The first type of exclusion zone is a permanent exclusion zone defined by the area where soil concentrations are known to exceed the Preliminary Remediation Goals (PRGs), as indicated on Figures 4 through 8 of the Work Plan (FWS, April 2012). The second type of exclusion zone is a work area exclusion zone. The work area exclusion zones apply to work performed outside of the PRG exclusion zone. The work area exclusion zones around work areas for Area 7 of the AUS OU will be temporary (*i.e.*, developed at each new work location). These temporary exclusion zones will be established at a variety of locations throughout the site during the project duration (*e.g.*, each well installation location, or soil boring location).

The exclusion zones for the Phase I land-based activities are shown on Figure 7-1. The PRG exclusion zone encompasses the Warehouse buildings (IN-1-3 through IN-1-6), as well as soil adjacent to the Warehouse buildings, as indicated on the Figure. Mousertown Road is not considered to be part of the exclusion zone. The PRG exclusion zone will not be physically marked in the field, except when work is being performed within or adjacent to this area. When work is to be performed within or adjacent to the PRG exclusion zone, the work areas will be discussed with field personnel at a daily safety meeting, and the edge of the exclusion zone nearest to the work area will be marked with safety cones and/or safety tape.

As shown on Figure 7-1, temporary work area exclusion zones will be established around each of the monitoring well locations and around the central decontamination area, **when work is being conducted in these areas**. An additional temporary exclusion zone may be established at a central location for the purpose of sample processing. The temporary work area exclusion zones will be identified as the area immediately surrounding the work area and extend at least 20 feet radially beyond the sampler and/or equipment. For drilling activities at each new monitoring well location the temporary exclusion zone may be expanded for safety purposes and to accommodate drilling and associated equipment. The temporary exclusion zones for land-based activities will be marked with safety cones and/or safety tape.

An IDW storage area and central decontamination pad will be established in accordance with SOP-01 included in Attachment 1 of the FSP (TRC, 2014). The location shown on Figure 7-1 is a proposed location. The final location of these facilities, as well as the location of a support trailer and central sample processing area, depend in part on site facilities, and will be determined in consultation with FWS at the pre-investigation site inspection. The exclusion zone around the IDW storage, decontamination area, and sample processing area will be marked with safety cones and/or safety tape as discussed above.

All non-essential vehicles and equipment will remain outside of the exclusion zones. In the event that the PRG exclusion zone must be traversed in order to access a work area, the access path will be covered with swamp mats, plywood, and/or other appropriate material to create a temporary road surface and to prevent contact with potentially contaminated soil. Temporary roads will be treated as being outside the exclusion zone, similar to Mousertown Road. At the completion of work, the materials used to create the temporary roadway will be removed and either be decontaminated in accordance with SOP-01 or disposed in accordance with SOP-11 (SOPs included in Attachment 1 of the FSP, TRC, 2014). Any vehicle or piece of equipment that comes in contact with soil within the PRG exclusion zone will be decontaminated in accordance with SOP-01 and SOP-02.

Temporary exclusion zones will be established for fish, sediment, and surface water sampling within the Crab Orchard Lake, Lake Embayment, and Crab Orchard Creek for Phase I activities. The exclusion zones for water based sampling activities will be identified as the area immediately surrounding the work area and extend a minimum of 20 feet radially beyond the sampler, boat, and/or sampling equipment. Since access to the water based sampling locations is already restricted, these exclusion zones will not be marked in the field.

Contamination Reduction Zone(s)

The contamination reduction zone is a transition zone between the potentially contaminated area and the support zone, and serves as a buffer to reduce the possibility of the support zone becoming contaminated.

- For land-based activities, an entry point to each exclusion zone will be established. At this entry point, an approximately 10 foot by 15 foot area immediately outside the exclusion zone will be cordoned off for decontamination of equipment and personnel. This contamination reduction zone (CRZ) will include containers to dispose of used PPE, decontamination solutions for sampling equipment in accordance with SOP-01 and SOP-02 (TRC, 2014), and wash station for personnel.

- For water based activities, a CRZ will be established on shore by cordoning off an approximately 10 foot by 15 foot area to accommodate put-in and take-out of the sampling boat, as well as decontamination of personnel and equipment. The size of the CRZ may be expanded for safety or to accommodate additional equipment. When on-water work has been completed, the boat will be placed on a trailer and taken to the central decontamination pad and decontaminated in accordance with SOP-01.

Field personnel will wear the required PPE while working in the contamination reduction zones. Before personnel enter the support zones, they will remove the PPE worn in the contamination reduction zones according to the decontamination procedures outlined later in this section.

Support Zone(s)

The support zone is a non-contaminated or clean area. The support zones are identified as the areas outside of the exclusion zones and CRZs. Protective clothing is not required in this zone. Clean PPE will be kept accessible to field personnel in the support zone. Water, soap, and paper towels will be kept in a clean location for both regular clean-up and emergency use.

Decontamination Procedures

Field personnel and equipment will be decontaminated in order to minimize the transfer of contaminants from and within the project site.

Field Personnel

Water, soap, and paper towels will be kept in a clean location for both regular clean-up and emergency use. The decontamination procedures for field personnel using Level D are as follows:

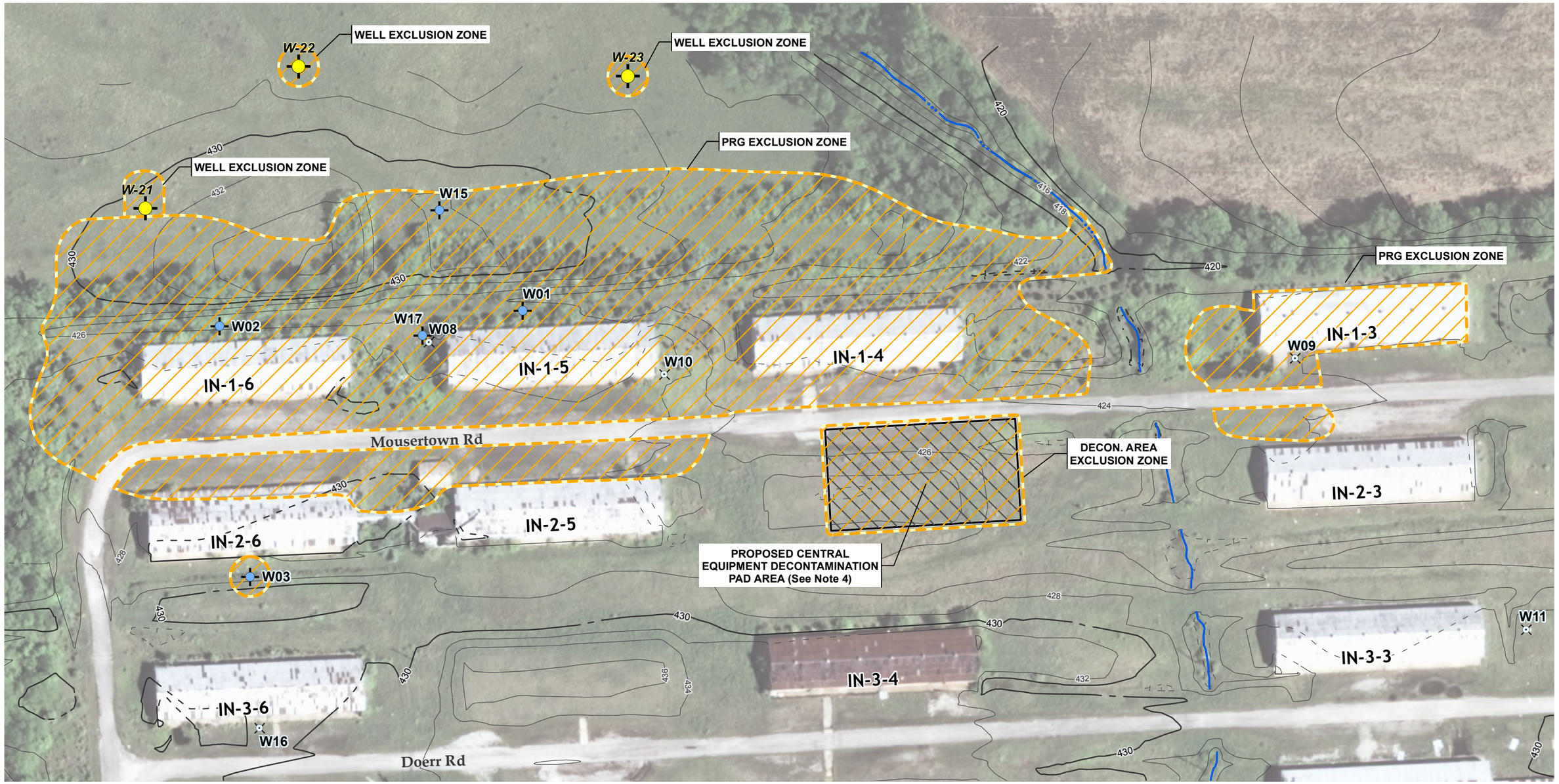
- Remove any gross soil from boots and gloves with water and brush. If muddy conditions are present, workers shall use disposable boot covers or use rubber boots. Disposable boot covers will be placed in the disposal bag.
- Remove Tyvek PPE and place in the disposal bag.
- Wash/rinse safety boots before leaving the decontamination area.
- Wash/rinse safety goggles and hard hats before leaving the decontamination area.
- Remove nitrile gloves and place in the disposal bag.
- Wash and dry hands, face, and neck before leaving the contamination reduction zone and place used paper towels in the disposal bag.
- Separate containers will be used for the washing station and the rinsing station.

- Containerize decontamination water (if generated) in dedicated drum at the decontamination pad at the site.
- Dispose of the plastic bags containing the PPE waste materials in on-site roll-off containers.

Water and soap solutions used to clean personnel (hands, face, and neck) will be single-use solutions dispensed directly from clean containers. Equipment (e.g., hard hats and goggles) may be cleaned in containers of decontamination fluids intended for multiple uses. Containers of decontamination fluids used for equipment will be changed out in accordance with SOP-02.

Sampling Equipment

A central decontamination pad will be constructed to accommodate decontamination of all drilling rigs, trucks, boats, and equipment. The decontamination procedures for drill rigs, drilling equipment and field equipment will be completed in accordance with SOP-01 and SOP-02 included in Attachment 1 of the FSP (TRC, 2014). Decontamination fluids utilized at individual drilling locations will be changed out in accordance with SOP-01 and SOP-02.



LEGEND

- EXISTING MONITORING WELL LOCATION
- TEMPORARY WELL LOCATION (PRESUMED TO BE ABANDONED)
- PROPOSED MONTORING WELL LOCATION
- EXCLUSION ZONE
- DECONTAMINATION PAD AREA

NOTES

1. BASE MAP IMAGERY FROM USGS HIGH RESOLUTION STATE ORTHOIMAGERY FOR WILLIAMSON COUNTY, IL, MARCH 2011.
2. OTHER MAP INFORMATION FROM PHOTOGRAMMETRIC SITE SURVEY CONDUCTED IN 2000.
3. EXCLUSION ZONES FOR WELLS ARE TEMPORARY AND APPLY ONLY DURING CONSTRUCTION OF EACH WELL.
4. FINAL SIZE OF DECONTAMINATION PAD WILL DEPEND ON THE EQUIPMENT BROUGHT TO THE SITE. FINAL SIZE WILL MEET OR EXCEED THE 16'x16' SIZE AND SPECIFICATIONS OUTLINED IN SOP-1.

N

0 100 200 Feet

1 " = 100 '
1:1,200

EE/CA INVESTIGATION PHASE I
AREA 7 PESTICIDE AREA, AUS OU
CRAB ORCHARD NATIONAL WILDLIFE REFUGE

EXCLUSION ZONES FOR LAND BASED ACTIVITIES

DRAWN BY:	PAPEZ J	SCALE:	PROJ. NO. 194355-002
CHECKED BY:	WESTOVER M	1: 1,200	FILE NO. 194355-008-ez.mxd
APPROVED BY:	STOLZENBURG T	DATE PRINTED:	**FIGURE 7-1**
DATE:	JUNE 2014		

TRC
708 Heartland Trail, Suite 3000
Madison, WI 53717
Phone: 608.826.3600
www.trcsolutions.com

TRC - GIS
Coordinate System: NAD 1983 UTM Zone 16N (Meter)
Map Rotation: 0
Printed By: JPAPEZ on 9/6/2012, 03:31:23 PM
Path: E:\CrabOrchardNWR\Area7\2012_194355\194355-008-ez.mxd

Section 8
Medical Surveillance and Training

Training Required

Check "A" if training required for everyone, and check "T" if training required for specific task.

A	T	SUBJECT	REFERENCE	
			29 CFR 1910	29 CFR 1926 or Other
☒	☐	HAZWOPER 40 hour	1910.120	1926.65
☐	☒	3-Day HAZWOPER Supervised On-Site	1910.120	1926.65
☒	☐	8-Hour HAZWOPER Refresher	1910.120	1926.65
☐	☐	8-Hour Supervisor HAZWOPER	1910.120	1926.65
☐	☒	First Aid, CPR	1910.151	1926.23,.50
☐	☒	Respiratory Protection	1910.134	1926.103
☐	☐	Confined Space ☐ Permit attached	1910.146	1926.21
☐	☐	Mine Safety (MSHA)	N/A	30 CFR 48.8
☐	☐	Lockout/Tagout ☐ Permit attached	1910.147	1926.417
☐	☐	Bloodborne Pathogens	1910.1030	N/A
☐	☐	Noise Exposure	1910.95	1926.52
☐	☐	Competent Person	N/A	1926.32,.450,.650
☐	☐	Construction Health and Safety OSHA 10-Hour	N/A	1926.21
☐	☐	Demolition	N/A	1926.850
☐	☐	Excavations ☐ Permit attached	N/A	1926.650-652
☐	☐	Electrical Work	1910.332	1926.400-.449
☐	☐	Ladders/Stairways	N/A	1926.1050-1060
☐	☐	Scaffolding	1910.28	1926.450-454
☐	☐	Fall Protection	1910.23-29; 1910.66-68	1926.104,.501
☐	☐	Commercial Diving	1910.410	1926.1071-1092
☐	☐	Hot Work ☐ Permit attached	1910.251-255	1926.350
☐	☒	Lead Awareness(2)	1910.1025	1926.62
☐	☒	Asbestos Awareness(2)	1910.1001	1926.1101
☐	☐	Cadmium	1910.1027	1926.1127
☐	☐	Benzene	1910.1028	1926.1128
☐	☐	Ionizing Radiation	1910.1096	1926.53; 10 CFR 19.12
☐	☐	Troxler or NITON Gauge User	1910.1096	10 CFR 19.12
☐	☐	Radiation Safety Program	1910.1096	10 CFR 20.1101
☐	☐	Hazard Communication (HAZCOM)	1910.1200	1926.59
☐	☐	DOT Hazardous Materials Shipping	1910.1201	49 CFR 172.704

Other Training: ☐ Not Applicable ☒ Electrofishing Training required for operator of electrofishing equipment.

Task Footnotes:

(1) Required for HSR and electrofishing personnel

(2) Required for building survey

Medical Surveillance

Surveillance Required:

	29 CFR 1910	29 CFR 1926 or Other
☒ HAZWOPER Physical - Baseline	1910.120	1926.65
☐ HAZWOPER Physical – Annual	1910.120	1926.65
☒ HAZWOPER Physical - Biennial	1910.120	1926.65
☒ OSHA Respiratory Protection Questionnaire	1910.134	1926.103
☐ Respiratory Certification Exam	1910.134	1926.103
☐ Arsenic (urine) **	1910.1018	N/A
☐ Asbestos **	1910.1001	1926.1101
☐ Cadmium (blood) **	1910.1027	1926.1127
☐ Lead/ZPP (blood) **	1910.1025	1926.62
☐ Mercury (blood) **	N/A	N/A
☐ PCB **	N/A	N/A
☐ Vinyl Chloride **	1910.1017	1926.117
☐ Hepatitis B Vaccine (series) **	1910.1030	N/A
☐ Tetanus/Diphtheria	N/A	Stay Current
☐ Stress Test	N/A	Only as requested
☐ Visual Acuity Test	N/A	Only as requested
☐ Hearing Test (Audiometry)	N/A	Only as requested
☐ Pulmonary Function	N/A	Only as requested

** Specify frequency of surveillance if checked.

Note: TRC has a "Drug and Alcohol-Free Workplace" policy (#900013753). TRC may require employees or subcontractors to be tested upon reasonable suspicion, following accidents or incidents during work activities, or during travel to or from a project site. Client policies may be stricter in regard to procedures following an accident. Project managers must be aware of these and inform employees and subcontractors of any additional requirements.

Section 9
Signature Page

Acknowledgment Statement:

As an employee of TRC, I have reviewed the Hazard Assessment (HA)/Health & Safety Plan (HASP). I hereby acknowledge that I have received the **required level of training and medical surveillance**, that I am knowledgeable about the contents of this site-specific HASP, and that I will use personal protective equipment (PPE) and follow procedures specified in the HASP.

Signatures of TRC Site Personnel:

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

_____ Date: _____

Attachment A
Field Audit

Health and Safety Field Audit Documentation:

If this project has been selected as a field audit candidate, the auditor will review a copy of this HSP and make comments, edits, additions, or deletions on the copy. The audit copy of this document will then be forwarded to the office HSC for review. After review, the HSC will then forward the copy to the Project Manager for review and filing.

_____ (auditor) Date: _____

TRC Project/Field Safety Audit Form

Project Name: _____ **Office Location:** _____

Project Number: _____ **Date of Audit:** _____

		Yes	No	N/A	Corrective Action Notes
General					
1	For TRC projects with temporary offices, are OSHA and job-site warning posters posted and are job-site injury records kept?				
2	Are all TRC personnel current on training requirements (i.e., 40-Hour HAZWOPER, 8-Hour Refresher)?				
3	Is training documentation for TRC employees available on site?				
4	Are appropriate TRC personnel current with medical surveillance protocol?				
5	Is at least one TRC employee on site currently trained in CPR and First Aid?				
6	Is there a stocked first aid kit located near/in job trailers?				
7	Are all containers labeled to clearly identify their contents?				
8	Are hot work zones established for hazardous waste operation and enforced?				
9	Are compressed gas cylinders being used on site properly secured?				
10	Are daily, pre-work safety meetings being held?				
TRC Subcontractors					
11	Were subcontractors qualified for the project by using TRC's subcontractor H&S Qualification form?				
12	Are subcontractors using appropriate personal protective equipment to protect their employees?				
13	Have all non-TRC employees on site been informed as to possible hazards?				
14	Does the subcontractor have a stocked first aid kit in their job trailer?				
TRC H&S Plan					
15	Has the H&S plan been reviewed and signed by all on-site TRC personnel?				
16	Are H&S procedures listed in the TRC H&S plan being followed by TRC personnel?				
17	Does the TRC H&S plan address all apparent hazards at this site?				
18	Is the TRC H&S plan specific to the Project operations/TRC project responsibilities?				

Check Yes, No or N/A for each item

For all non-compliant responses, enter description and corrective action(s) on notes page

TRC Project/Field Safety Audit Form

Project Name: _____ **Office Location:** _____

Project Number: _____ **Date of Audit:** _____

		Yes	No	N/A	Corrective Action Notes
19	Is appropriate PPE identified on the TRC H&S plan?				
20	Is the PPE being utilized by TRC personnel as directed in the H&S plan?				
Hazard Communication					
21	Are medical facilities identified on the TRC H&S plan?				
22	Are MSDSs for TRC-supplied materials available?				
23	Are MSDS for subcontractor-supplied materials available?				
24	Have employees received hazard communication training?				
25	Are hazardous substances clearly marked?				
26	Is there an Emergency Response Plan in place in case of unintentional release (i.e., spill kit)?				
Fire Protection/Prevention					
27	Is fire-fighting equipment available and in proper working condition?				
28	Have TRC personnel been trained in use of fire-fighting equipment?				
29	Are "no smoking" signs posted in appropriate locations?				
Electrical/Power Tools					
30	Are electrical dangers posted?				
31	Are ground fault circuit interrupters used?				
32	Are terminal/discount/breaker dead front boxes equipped with covers?				
33	Have known underground/overhead utilities been identified and clearly marked?				
34	Are power tools properly grounded or double insulated?				
35	Are mechanical ties and guards in use with power tools?				
36	Is there an appropriate Lockout/Tagout (LOTO) procedure in place?				

Check Yes, No or N/A for each item

For all non-compliant responses, enter description and corrective action(s) on notes page

TRC Project/Field Safety Audit Form

Project Name: _____ **Office Location:** _____

Project Number: _____ **Date of Audit:** _____

		Yes	No	N/A	Corrective Action Notes
Ladders					
37	Are ladders inspected and properly maintained (e.g., not painted)?				
38	Are ladders properly secured to prevent slipping, sliding, or falling?				
39	Do side rails extend 36 inches above the top of the landing?				
40	Are stepladders fully open when in use?				
41	Are metal ladders being used around electrical equipment?				
Scaffolding					
42	Have employees received training in proper scaffold use?				
43	Is there a competent person on site?				
44	Are all connections secure and scaffold equipment in good working order?				
45	Is scaffold tied into structure when it exceeds 4 times the base width of the scaffold?				
46	Are working areas free of debris, snow, grease, ice?				
47	Are workers protected from falling objects?				
48	Is the scaffold plumb and square with cross-bracing?				
49	Are guard rails, intermediate rails, toe-boards, and end rails in place for scaffolds over 10 ft.?				
Manholes and Permit-Required Confined Space Entry					
50	Has access and egress been provided?				
51	Has an entry permit been obtained?				
52	Have hazards been properly identified?				
53	Is air monitoring equipment on site, appropriate, calibrated, and in use?				
54	Are areas being ventilated before entry and during occupation?				

Check Yes, No or N/A for each item

For all non-compliant responses, enter description and corrective action(s) on notes page

TRC Project/Field Safety Audit Form

Project Name: _____ **Office Location:** _____

Project Number: _____ **Date of Audit:** _____

		Yes	No	N/A	Corrective Action Notes
55	Have entrant, attendant, and rescue personnel been identified?				
56	Is proper rescue equipment on site? Inspected?				
57	Is appropriate lighting provided?				
Motorized Vehicles					
58	Have operators received training?				
59	Are brakes, lights, horn, seat belts, backup lights or warning signals intact and functioning?				
60	Are personnel carried in a safe manner?				
61	Are fire extinguishers carried, if appropriate?				
Excavations					
62	Are excavations inspected daily?				
63	Is there any excavation entry by TRC staff?				
64	Is the competent person overseeing the trenching excavation work on site?				
65	Is shoring, sloping or benching appropriate?				
66	Is access and egress provided for employees working in excavations of 4 feet or greater in depth?				
67	Are materials stored within 2 feet of the excavation?				
68	Is the excavation barricaded?				
69	Have soils been classified (if sloping and benching is used as the protective system for employees)?				
Water Safety					
70	Are watercraft inspected before use for leaks, damage, etc.?				
71	Is necessary emergency gear (life jackets or rings, fire extinguishers, flares, etc.) available?				
72	Are employees trained on proper safety protocols involving wading and walking in water?				
73	Are employees using the "buddy system" when taking samples in water?				

Check Yes, No or N/A for each item

For all non-compliant responses, enter description and corrective action(s) on notes page

TRC Project/Field Safety Audit Form

Project Name: _____ **Office Location:** _____

Project Number: _____ **Date of Audit:** _____

		Yes	No	N/A	Corrective Action Notes
Other Items					
74					
75					
76					
77					
78					
79					
80					

Check Yes, No or N/A for each item

For all non-compliant responses, enter description and corrective action(s) on notes page